

ABSTRACT

A state space wavefront reconstructor for use in an adaptive optics control system is disclosed. The adaptive optics control system comprises a wavefront corrector having a surface controlled by a plurality of actuators, at least one wavefront sensor adapted to measure at least one wavefront state of the wavefront and generate wavefront sensor output signals indicative thereof, and a state space wavefront reconstructor adapted to receive the wavefront sensor output signals and generate a plurality of correction signals based thereon to be applied to the wavefront corrector. The wavefront reconstructor comprises a wavefront velocity estimator, a state space wavefront estimator, and a wavefront phase reconstructor. A method of compensating for the distortion of an optical wavefront using such a state space wavefront reconstructor is also disclosed.